

REMARKS

Claims 125-172 are now pending in the application. Claims 134-137, 139, 148-152, 163-166, and 168 have been withdrawn. Claims 125-127, 133, 140-142, 155, 156 and 169 are currently amended. Claims 170-172 are added as new. Support for the foregoing amendments can be found throughout the specification, drawings, and claims as originally filed. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

CLAIM OBJECTIONS

Claim 140 is objected to because of certain informalities. Applicant has amended claim 140 to address the Examiner's objection. Therefore, reconsideration and withdrawal of this objection is respectfully requested.

REJECTION UNDER 35 U.S.C. § 112

Claims 127, 142, and 156 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point and distinctly claim the subject matter which Applicant regards as the invention. This rejection is respectfully traversed.

Applicant has amended claims 127, 142, and 156 to address the Examiner's rejection. Therefore, reconsideration and withdrawal of this rejection is respectfully requested.

REJECTION UNDER 35 U.S.C. § 102

Claims 125-127, 129, 130, 132, 133, 140-142, 144-146, 154-156, 158, 160, 161, and 169 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Cleary et al. (U.S. Pub. No. 2002/0149660). This rejection is respectfully traversed.

The claimed invention is directed to a radiation source for curing fluid, for example ink, in a printer. The source includes a plurality of elements, for example light-emitting diodes (LEDs).

The inventor of the present invention recognizes that, as discussed in the present application at, for example, page 11 lines 1 to 21 and page 24 lines 10 to 23, the use of an array of elements in the radiation source can lead to artefacts in the printed image. In particular, where an array of elements is used, the radiation emitted in the region of the centre of an element is likely to differ from the radiation emitted in the region between two elements. Therefore there is a risk of there being a variation in the radiation dose received across the substrate. This can lead to differences in for example the curing of the ink on the substrate and thus the appearance of the resulting print.

Claim 126 calls for that “the array of LEDs comprises a plurality of adjacent rows of LEDs each row comprising a plurality of LEDs arranged in a row direction, wherein a row of LEDs is offset from an adjacent row of LEDs in a direction substantially parallel to the row direction.” In other words, the elements of the array are arranged in rows where the rows are offset from each other along the row direction. In that way the variation in radiation intensity across the array can be reduced. Applicant submits that **Cleary** fails to anticipate the above limitations.

Cleary at best appears to disclose a printhead arrangement in which a radiation source is provided on each of two sides of a printhead arrangement. In Figure 2A referred to by the Examiner, a single radiation source 24-1, 24-2 is located on each side of the printhead [0034]. Again, in Figure 4A, two radiation sources (42-1) are used: one on each side of the printhead array. Examples of radiation sources include glow bulbs, see [0042], and Xenon flash tubes, see [0047]. There is no indication that those sources include a plurality of elements.

Further, in the alternative embodiment of **Cleary** as shown in Figures 8 and 9, a row of LEDs is used for each radiation source, the rows being perpendicular to the curing direction. In other words, that the LEDs of the row of the source 100-1 of Figure 8A are in line with the LEDs of the other source 100-2 in the curing direction. Equally, each LED of the row of the source 102-1 of Figure 9A is in line with an LED of the other source 102-2 in the curing direction. Thus the radiation sources shown in Figure 8A and 9A of **Cleary** can lead to the problem of variation in radiation intensity across the printed substrate which is sought to be overcome or reduced by aspects of the present invention.

Applicant can find no mention, in **Cleary**, of providing a radiation source as defined in claim 126, in particular, of the rows of LED elements being offset.

In view of the foregoing, Applicant submits that claim 126 and its dependent claims 127-132 define over the art cited by the Examiner. Claim 133 and its dependent claim 138 as well as claim 155 and its dependent claims 156-162 and 167 define over the art cited by the Examiner for one or more of the reasons set forth above regarding claim 126.

Claim 140 calls for a radiation source in which an array of elements includes a plurality of rows of elements arranged such that an element is not aligned with another adjacent element in the curing direction. Applicant submits that **Cleary** fails to anticipate the above limitations.

By ensuring that the elements are not so aligned in embodiments of the claimed invention, the variation of radiation intensity received at the substrate in a direction perpendicular to the curing direction can be reduced. Thus as the substrate moves relative to the array of elements in the curing direction, the variation in curing performance across the substrate can be reduced and thus the risk of print artefacts due to the arrangement of the elements can be reduced. Applicant can find no mention of such an arrangement in any of the cited documents. Applicant notes that in the arrangements shown in Figure 8A and 9A of **Cleary**, each element of one of the sources is aligned with an element of the other source in the curing direction contrary to the requirement of claim 140.

In view of the foregoing, Applicant submits that claim 140 and its dependent claims 125, 141-147 and 153-154 define over the art cited by the Examiner.

Claim 169 calls for that “the elements are arranged in a plurality of rows of elements” and that “the elements of the array are in a non-rectangular arrangement.” Applicant submits that **Cleary** fails to anticipate the above limitations. Applicant notes that the arrangement of LED elements of the sources shown in Figures 8A and 9A of **Cleary** comprises a rectangular arrangement.

In view of the foregoing, Applicant submits that claim 169 defines over the art cited by the Examiner.

REJECTION UNDER 35 U.S.C. § 103

Claims 131, 147, and 162 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Cleary et al. (U.S. Pub. No. 2002/0149660) in view of Mills et al. (U.S. Pub. No. 2003/0035037). Claims 153 and 159 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Cleary et al. (U.S. Pub. No. 2002/0149660). Claims 138 and 167 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Cleary et al. (U.S. Pub. No. 2002/0149660) in view of Richards (U.S. Pub. No. 2003/0227527). These rejections are respectfully traversed.

Applicant submits that the arguments presented above regarding claims 126 and 140, and 155 apply here equally. Further, Applicant submits that **Mills** and **Richards** fail to cure the deficiencies of Cleary regarding claims 126, 140, and 155. Specifically, Applicant notes that Figures 8A and 9A of **Mills** correspond to the equivalent figures of **Cleary** and thus similar arguments apply. **Richards** appears silent about the limitations of claims 126, 140, and 155.

In view of the foregoing, Applicant submits that claims 126, 140, and 155 define over the art cited by the Examiner. Therefore, a) claims 131 and 138, b) claims 147 and 153, as well as c) claims 159, 162, and 167 define over the art cited by the Examiner by virtue of their dependency from claims 126, 140, and 155 respectively.

ALLOWABLE SUBJECT MATTER

The Examiner states that claims 128, 143, and 157 would be allowable if rewritten in independent form. Accordingly, Applicant has rewritten claims 128, 143, and 157 as new independent claims 170-172, including the limitations of the base claim and any intervening claims. Therefore, claims 170-172 should now be in condition for allowance.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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By: 

G. Gregory Schivley
Reg. No. 27,382

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. Box 828
Bloomfield Hills, Michigan 48303
(248) 641-1600

GGS/PFD/evm